

What is claimed is:

1. An electronic device comprising at least an antenna, an information processing apparatus for the purpose of processing information captured by said antenna, and a metal exterior parts
5 capable of housing therewithin said antenna and said information processing apparatus, wherein said metal exterior parts is configured so that said antenna can receive magnetic flux from outside said metal exterior parts, that has passed through said metal exterior parts and can resonate, and also wherein at said
10 metal exterior parts comprises an outer case and a caseback, and wherein said antenna is in the vicinity of said information processing apparatus and is surrounded by said outer case and said caseback.

2. An electronic device according to claim 1, wherein in a
15 case in which said electronic device is an electronic watch comprising an antenna, a watch movement, a watch dial, an outer case, and a caseback, said outer case and caseback are formed from metal, and said antenna is disposed inside a space surrounded by said outer case, said caseback and said watch dial
20 together with said watch movement, so that said antenna overlaps with said watch dial in a planar manner, and wherein said watch dial is made of a non-metallic material.

3. An electronic device according to either claim 1 or
claim 2, comprising a solar cell, which serves as the drive power
25 of said watch movement, between said watch dial and said watch movement, said solar cell being substantially formed by a material that is non-metallic material and that is also magnetically permeable.

4. An electronic device according to any one of claim 1
30 through 3, wherein said solar cell is in the shape of a film using a non-metal sheet.

5. An electronic device comprising at least an antenna, an information processing apparatus for the purpose of processing information captured by said antenna, and a metal exterior parts capable of housing therewithin said antenna and said information processing apparatus, wherein said metal exterior parts is configured so that said antenna can receive magnetic flux from outside said metal exterior parts, that has passed through said metal exterior parts and can resonate, and also wherein at least a part of said metal exterior parts has an electrical resistance value that is different from another part of said metal exterior parts.

6. An electronic device according to claim 5, which is one electronic device selected from a group consisting of a watch, a mobile telephone, and a radio communication apparatus.

15 7. An electronic device according to either claim 5 or claim 6, wherein said metal exterior parts is configured so as to be able to suppress the generation of eddy currents in said metal exterior parts in a condition in which said antenna resonates.

20 8. An electronic device according to any one of claim 1 through claim 7, wherein said metal exterior parts is made of one or a plurality of materials selected from a group consisting of stainless steel, titanium, a titanium alloy, gold, a gold alloy, silver, a silver alloy, copper, a copper alloy, brass, aluminum, an aluminum alloy, zinc, a zinc alloy, magnesium, a magnesium alloy, and an ultra-hard metal (an alloy including tungsten carbide and tantalum carbide).

25 9. An electronic device according to any one of claim 1 through claim 8, wherein said metal exterior parts is formed by a least two metal members.

30 10. An electronic device according to any one of claim 1 through claim 9, wherein said metal exterior parts comprises a body (side) member and a caseback member, wherein said body

(side) member and said caseback member are mutually joined together.

11. An electronic device according to either claim 9 of claim 10, wherein said body (side) member and said caseback member are either mutually held together or mutually removably joined together.
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12. An electronic device according to any one of claim 9 through claim 11, wherein said body (side) member and said caseback member are mutually joined by one or a plurality of methods selected from a group consisting of a screw method, an internal threading method, a holding method using a plurality of threaded bolts, a crimping method, a packing holding method, a dowel biting holding method, a snap method, a welding method, a brazing method, a bayonet method, and a solid-state diffusion joining method.
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13. An electronic device according to any one of claim 1 through claim 12, wherein in said metal exterior parts said body (side) member and said caseback member are integrally configured as one, and wherein said body member is configured so that a plurality of body sub-members are mutually joined.
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14. An electronic device according to claim 13, wherein in said metal exterior parts said body (side) member and said caseback member are integrally configured as one and wherein said metal exterior parts is formed by an inner body member and an outer body member, said inner body member and said outer body member being mutually joined together.
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15. An electronic device according to claim 13, wherein in said metal exterior parts said body (side) member and said caseback member are integrally configured as one, and wherein one part of said body member comprises at least one inserted member selected from a group consisting of a pipe, a glass, a bezel, an internal register ring, and an dial open.
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16. An electronic device according to any one of claim 1 through claim 15, wherein of a plurality of members forming said metal exterior parts, an electrical resistance value of a metal forming one member thereof is different from an electrical 5 resistance value of a metal forming another part.

17. An electronic device according to any one of claim 1 through claim 16, wherein an electrical resistance value of a mutually joining part of a plurality of members forming said metal exterior parts is different from an electrical resistance 10 value of a metal forming said metal exterior parts.

18. An electronic device comprising at least an antenna, an information processing apparatus for the purpose of processing information captured by said antenna, and a metal exterior parts capable of housing therewithin said antenna and said information 15 processing apparatus, wherein said metal exterior parts is configured so that said antenna can receive magnetic flux from outside said metal exterior parts, that has passed through said metal exterior parts and can resonate, and also wherein at said metal exterior parts comprises an body (side) member and a 20 caseback member, and wherein said body (side) member and said caseback member are mutually joined together, the mutual peeling force between said body (side) member and said caseback member being 10^{-4} N • m to 6.0 N • m.

19. An electronic device comprising at least an antenna, an 25 information processing apparatus for the purpose of processing information captured by said antenna, and a metal exterior parts capable of housing therewithin said antenna and said information processing apparatus, wherein said metal exterior parts is configured so that said antenna can receive magnetic flux from 30 outside said metal exterior parts, that has passed through said metal exterior parts and can resonate, and also wherein at said metal exterior parts comprises an body (side) member and a

caseback member, and wherein said body (side) member and said caseback member are mutually joined by a screw mechanism, the mutual loosening torque between said body (side) member and said caseback member being 0.1 N · m to 6.0 N · m, and preferably 5 being 0.2 N · m to 3.5 N · m.

20. An electronic device according to claim 17, wherein at least one part of a plurality of mutually joining part forming said metal exterior parts has interposed therein an inserted member having an electrical resistance value differing from an 10 electrical resistance value of a metal forming said metal exterior parts.

21. An electronic device according to claim 20, wherein said inserted member is a member formed separately from a plurality of members forming said metal exterior parts.

15 22. An electronic device according to either claim 20 or claim 21, wherein said inserted member is at least one member of a plurality of members forming said metal exterior parts and is a film formed on a member making contact with said metal exterior parts.

20 23. An electronic device according to claim 22, wherein said film is formed by an appropriate surface treatment and/or hardening treatment of a least one part forming said metal exterior parts.

25 24. An electronic device according to claim 23, wherein said surface treatment is one method selected from a group consisting of a wet plating method, a dry plating method, and heat treatment.

30 25. An electronic device according to any one of claim 20 through claim 24, wherein an electrical resistance value of said inserted member is larger than an electrical resistance value of a plurality of members forming said metal exterior parts.

26. An electronic device according to any one of claim 20 to claim 25, wherein said inserted member is made of one material selected from a group consisting of resin, rubber (organic), an oxide insulated material, a thin film, ink, and a paint.

5 27. An electronic device according to any one of claim 9 through claim 17 or claim 20 through 26, wherein a non-contacting part is formed on at least one part of a joining part formed by the joining of at least two metal members in said metal exterior parts.

10 28. An electronic device according to claim 27, wherein one part of a joining surface in at least one metal member of at least two metal members forming said joining part is removed to form a gap between said joining parts.

15 29. An electronic device according to claim 28, wherein a height of said gap is 0.1 to 1000 µm and preferably 60 to 160 µm.

30. An electronic device according to either claim 27 or claim 28, wherein said metal exterior parts comprises a body (side) member and a caseback member, which are integrally formed as one, and further wherein in a case in which the body (side) member and the caseback member are mutually joined by a screw mechanism, one part of said screw mechanism is removed to form a gap.

25 31. An electronic device according to any one of claim 9 through claim 17 or claim 20 through claim 26, wherein the planar surface area of at least one part of a joining surface formed by a joining of at least two metal members in said metal exterior parts is formed so as to be smaller than the planar surface area of the remaining part.

30 32. An electronic device according to any one of claim 1 through claim 31, wherein the material thickness of at least one part of said body member and/or said caseback member to which said coil of said antenna is projected, is thinner than the

material thickness of the other part of said body member or said caseback member.

33. An electronic device comprising at least an antenna, an information processing apparatus for the purpose of processing information captured by said antenna, and a metal exterior parts capable of housing therewithin said antenna and said information processing apparatus, wherein said metal exterior parts is configured so that said antenna can receive magnetic flux from outside said metal exterior parts, that has passed through said metal exterior parts and can resonate, and also wherein said antenna is configured so that said antenna is provided with a straight or curved magnetic core having a maximum longitudinal length that is shorter than the maximum diameter of the metal exterior parts.

15 34. An electronic device according to claim 33, wherein said antenna is disposed in the vicinity of a peripheral end part of said metal exterior parts.

35. An electronic device according to any one of claim 1 through claim 32, comprising an antenna, an information processing apparatus for the purpose of processing information captured by said antenna, and a metal exterior parts capable of housing therewithin said antenna and said information processing apparatus, wherein said metal exterior parts is configured so that said antenna can receive magnetic flux from outside said metal exterior parts, that has passed through said metal exterior parts and can resonate, and wherein said antenna is configured so that said antenna is provided with a straight or curved magnetic core having a maximum longitudinal length that is shorter than the maximum diameter of the metal exterior parts.

30 36. An electronic device according to claim 35, wherein said antenna is disposed in the vicinity of the outer periphery of said metal exterior parts.

37. An electronic device according to any one of claim 1 through claim 32, wherein said antenna is disposed in the vicinity of the periphery of a metal exterior parts.

38. An electronic device according to any one of claim 20 through claim 30, wherein said antenna is disposed in the vicinity of said inserted member or said gap.

39. An electronic device according to claim 38, wherein said inserted member or said gap of said metal exterior parts is formed either continuously or intermittently in said joining part 10 surrounded by a fan-shaped region formed by both end parts of said magnetic core of said antenna having a prescribed length and the center part of said metal exterior parts.

40. An electronic device according to claim 39, wherein said fan-shaped region is a region expressed as a ratio between 15 the core length of said antenna and the angle of said joining part.

41. An electronic device according to either claim 39 or claim 40, wherein an angle range of said fan-shaped region is 30 to 180°, preferably is 50 to 120°, and more preferably is 60 to 20 90°.

42. An electronic device according to any one of claim 1 through claim 41, comprising an electrically conductive part in at least one part of said metal exterior parts.

43. An electronic device according to any one of claim 1 through claim 42, wherein an L value of said antenna is 1600 mH or less.

44. An electronic device according to any one of claim 1 through claim 42, wherein said L value is 800 mH or less.

45. An electronic device according to any one of claim 1 through claim 42, wherein said L value is 220 mH or less.

46. An electronic device according to any one of claim 1 through claim 42, wherein a coil resistance value of said antenna is 1 kΩ or less.

47. An electronic device according to any one of claim 1 through claim 42, wherein said coil resistance value is 400 Ω or less.

48. An electronic device according to any one of claim 1 through claim 42, wherein said coil resistance is 100 Ω or less.

49. An electronic device according to any one of claim 1 through claim 42, wherein a number of coil turns of said antenna is 1000 or greater.

50. An electronic device according to any one of claim 1 through claim 42, wherein said number of coil turns is 1500 or greater.

51. An electronic device according to any one of claim 1 through claim 42, wherein said coil wire has a wire diameter of 0.1 mm or less.

52. An electronic device according to any one of claim 1 through 51, wherein said antenna is disposed so as to come into contact with an inner surface of said metal exterior parts.

53. An electronic device according to any one of claim 1 through claim 51, wherein said antenna is disposed with a gap between it and an inner surface of said metal exterior parts.

54. An electronic device according to any one of claim 1 through claim 53, wherein said metal exterior parts and said antenna are set so that the thickness of a body member of said metal exterior parts is 300 μm to 5000 μm.

55. An electronic device according to any one of claim 1 through claim 53, wherein said metal exterior parts and said antenna are set so that the thickness of a body member of said metal exterior parts is 500 μm to 2000 μm.

56. An electronic device according to any one of claim 1 through claim 53, wherein said metal exterior parts and said antenna are set so that a gap between said inner surface of said body member and said antenna is 0 to 40000 μm .

5 57. An electronic device according to any one of claim 1 through claim 53, wherein said metal exterior parts and said antenna are set so that a gap between said inner surface of said body member and said antenna is 500 μm to 10000 μm .

10 58. An electronic device according to any one of claim 1 through claim 53, wherein said metal exterior parts and said antenna are set so that the thickness of a caseback member of said metal exterior parts is 100 μm to 5000 μm .

15 59. An electronic device according to any one of claim 1 through claim 53, wherein said metal exterior parts and said antenna are set so that the thickness of a caseback member of said metal exterior parts is 300 μm to 2000 μm .

20 60. An electronic device according to any one of claim 1 through claim 53, wherein said metal exterior parts and said antenna are set so that a gap between an inner surface of said caseback and said antenna is 0 to 5000 μm .

61. An electronic device according to any one of claim 1 through claim 53, wherein said metal exterior parts and said antenna are set so that a gap between an inner surface of said caseback and said antenna is 100 μm to 700 μm .

25 62. An electronic device according to any one of claim 1 through claim 53, wherein an inner surface of a body member of said metal exterior parts and an outer surface of said antenna are substantially parallel.

30 63. An electronic device according to any one of claim 1 through claim 53, wherein an inner surface of a caseback member of said metal exterior parts and an outer surface of said antenna are substantially parallel.

64. An electronic device according to any one of claim 1 through claim 53, wherein a caseback member of said metal exterior parts is formed with a planar secondary shape.

65. An electronic device according to any one of claim 1 through claim 53, wherein one end surface of two end parts of said antenna is substantially perpendicular to an inner surface of a caseback member of said metal exterior parts.

66. An electronic device according to any one of claim 1 through claim 65, wherein a non-magnetic material having an electrical resistivity of $7.0 \mu\Omega \cdot \text{cm}$ or less is fixed to an inner surface of said metal exterior parts.

67. An electronic device according to claim 66, wherein said non-magnetic material is one material selected from a group consisting of gold, a gold alloy, silver, a silver alloy, copper, a copper alloy, brass, aluminum, an aluminum alloy, zinc, a zinc alloy, magnesium, and a magnesium alloy.

68. An electronic device according to either claim 66 or claim 67, wherein said antenna comprises a magnetic core and a coil multiply wound around said magnetic core, and wherein a member to which said antenna is projected parallel along at least one plane that includes the axis of said magnetic core or a part to which said member is projected, is made of a non-magnetic material.

69. An electronic device according to either claim 66 or claim 67, wherein said antenna comprising a magnetic core and coils multiply wound around said magnetic core is configured so that at least an end part of said antenna or a member corresponding thereto, or a part corresponding to the member be made of said non-magnetic material.

70. An electronic device according to any one of claim 1 through claim 65, wherein at least one of said body (side) member

and caseback member is subjected to surface treatment and/or curing.